

Monitoring Study Group Meeting Minutes

April 10, 2007

CAL FIRE Mendocino Unit Headquarters, Howard Forest Training Center

The following people attended the MSG meeting: Tharon O'Dell (GDRCO), John Munn (CAL FIRE), Allyson Shaidnagle (CTM), Richard Gienger (HWC/SSRC), Mike Liquori (Sound Watershed Consulting), Clay Brandow (CAL FIRE), Daniel Merkely (SWRCB), Elizabeth Keppeler (USFS-PSW), Robert Horvat (CAL FIRE-JDSF), Tom Leroy (PWA), Steve Garcia (CAL FIRE), Peter Ribar (CTM), Debbie Duckworth (NRM), Bill Baxter (CAL FIRE), and Pete Cafferata (CAL FIRE). **[Note: action items are shown in bold print].**

We began the meeting with general monitoring-related announcements:

- Pete Cafferata announced that the American Institute of Hydrology (AIH) was holding its annual meeting titled "Integrated Watershed Management: Partnerships in Science, Technology, and Planning" on April 22-25, 2007 in Reno, Nevada.
- Richard Gienger reported that the 25th Annual Salmonid Restoration Conference held in Santa Rosa on March 7-10, 2007 was a success. He listed some of the people who received awards at the session and briefly described a few of the key presentations.
- Richard Gienger announced that there would be a tour of the upper Mattole River watershed to view decommissioned roads on lands owned by the Sanctuary Forest, Inc.
- Richard Gienger stated that a meeting would be held on April 24th to discuss the development of a monitoring handbook for landowners related to the Mattole River PTEIR.
- Peter Ribar announced that the BOF's Road Rules Committee will bring a revised road rule package to the BOF at their May meeting in Sacramento.
- Pete Cafferata informed the group that a draft final report for the study comparing turbidity values from different turbidimeters by Jack Lewis, USFS-PSW, Randy Klein, RNSP, and Rand Eads, Rivermetrics, Inc. has been submitted to CAL FIRE and the NCRWQCB for review. Instruments tested include YSI Environmental Sondes, FTS DTS-12s and D&A Instruments OBS-3 units.
- Pete Cafferata announced that interagency training workshops for the four Review Team agencies will be presented on May 9-10 in the Willits area and June 13-14 in Redding. The purpose of the workshops is to facilitate better working relationships among the agencies and to develop common understandings related to specific issues. The initial training topic will continue to be watercourse crossings. The main audience is Review Team agency field staff involved in plan review.
- Pete Cafferata announced that the California Forest Soils Council would hold its winter/spring meeting on April 13th at UC-Davis. The topic for the meeting was: "Climate Change—Forest Soils, Forest Management, and Carbon Sequestration in the Sierra Nevada."

Pacific Watershed Associates DFG Road Decommissioning Report

Mr. Tom Leroy, Pacific Watershed Associates, provided the MSG with a PowerPoint presentation on the PWA road decommissioning report prepared in 2005 for the California Department of Fish and Game. Watercourse crossings, road segments between crossings, and landslides were studied, but Tom placed the most emphasis on decommissioned crossings for this presentation. To introduce the topic, he showed photos of legacy road crossing failures in the lower part of the Redwood Creek drainage, and the extreme levels of fluvial (gully) erosion that occurred on these poorly designed and constructed roads with water diversion. He also illustrated chronic surface erosion on decomposed granitic soils and roads with inboard ditchlines. Road inventory work is used

to locate road segments with high sediment delivery potential and develop a prioritization to either upgrade required roads or decommission them.

As part of the DFG study, PWA evaluated 51 miles of road decommissioned between 1998 and 2003 that were funded by DFG grants (34% of the total decommissioned road length funded with grants). Included in this sample were 275 stream crossings. The evaluation took place in 11 geographic areas located in northwestern California based on the spatial distribution of decommissioning sites, the dominant local geologic bedrock type, ownerships, and available precipitation data. Project goals included: (1) determining the road decommissioning effectiveness of the current DFG restoration program, (2) measuring post-treatment erosion at specific sites and road segments that had been decommissioned under the DFG fisheries restoration program, and (3) determining whether the evaluated specific sites and road segments met current DFG standards.

DFG crossing decommissioning protocols call for having: (1) sideslopes excavated and sloped at 2:1 or to the grade of side slopes above and below the crossing; (2) the channel profile excavated at a natural channel grade through the crossing with no abrupt grade changes at the top and the bottom of the excavation; (3) the channel width excavated to match or exceed the channel width outside of the influence of the crossing; and (4) road approaches broken up to minimize direct runoff into the crossing.

Methods for the study included acquiring the data from DFG, geographic segmentation into 11 regions for the total population of 152 road miles, developing an appropriate data form, field assessment, GIS plotting of sites, and data entry into a database. Road segments evaluated were randomly selected within the 11 geographic regions. Tom informed the group that the data from Steinacher Road in the Klamath National Forest would not be included in the PowerPoint graphics, even though they are included in the report prepared for DFG. The Steinacher Road sites have decomposed granitic soils that exhibited extreme levels of surface erosion and were excluded because the size of the crossings/excavations were so large (i.e., some crossing fills were over 50,000 yds³). They were not thought to be representative of the other sites evaluated throughout the North Coast region. Without the Steinacher Road sites, 250 crossings remain in the sample.

Erosion features inventoried in the field included channel incision, small debris slides/slumps, bank erosion, gullies, head cuts, and surface erosion. Crossing effectiveness (E) was defined as the measured erosion volume (er) divided by the original fill volume (ov) multiplied by 100, with the result subtracted from 100:

$$E = 100 - [(er/ov) \times 100]$$

The results showed that for the 250 decommissioned crossings, the most frequent erosion features recorded were: channel incision (213), surface erosion (161), slump/slide (91), and bank erosion (26). In terms of total sediment delivery, channel incision produced approximately 2900 yd³, while slump/slides and surface erosion both produced ~1750 yd³. For individual erosion features, head cuts and slump/slides produced the largest volumes of sediment, averaging close to 20 yd³/feature. Tom stated that while it is clear that most erosion occurs in the first couple of years following crossing excavation, this was difficult to document in this study, since the time since crossing removal work occurred varied considerably.

In terms of erosion causes at removed crossings, Tom stated that operator or supervisor causes were mainly due to under excavated fill ($\sim 2400 \text{ yd}^3$), and to a much lesser extent over excavated fill ($\sim 600 \text{ yd}^3$). Unavoidable causes mainly included overland flow and natural bank adjustments. Overall, 110 crossings met all of the DFG protocols and produced a total of $\sim 1900 \text{ yd}^3$ of delivered sediment, while 140 crossings did not meet one or more of the protocols, producing a total of $\sim 4325 \text{ yd}^3$. Averages for individual crossings meeting and not meeting protocols were 17 yd^3 and 31 yd^3 of sediment, respectively. The average for all the crossings was approximately 25 yd^3 . The total effectiveness, as defined above, was 95%, meaning that the post-treatment sediment delivery from decommissioned crossings was 5 percent of pre-treatment fill volume.

Overall crossing conclusions were as follows: (1) the most common erosion features associated with stream decommissioning under the DFG habitat restoration program are: channel incision, surface erosion, and mass wasting (either debris slides or slumps); (2) the most common causative factors for erosion features are: overland flow, natural bank adjustments, unexcavated fill, and over-excavation, (3) the most common operator or supervisor error was under-excavation of fill; (4) this study suggests the DFG decommissioning protocols for stream crossings are effective, but are not being entirely followed at 56% of the sites; (5) the average post decommissioning adjustment for a treated stream crossing is 5% of its original volume, and (6) stream crossing decommissioning is highly effective as a long-term solution to sediment reduction, but does have some short-term effects.

Fillslope and streamside landslides were also briefly addressed. Tom provided a figure showing that when slope gradient of excavated crossing banks were less than 50%, the number of slope failure features and volume of delivered sediment were 15 and 142 yd^3 , respectively. Conversely, if the slopes were greater than 50%, the numbers were 81 and 1815 yd^3 . This illustrates the extreme importance of having the slopes laid back at less than 50%. In general, the DFG decommissioning protocols for landslide sites were found to be effective and were, for the most part, followed. Additionally, post-decommissioning sediment delivery from treated landslide sites was minimal.

Finally, Tom rapidly summarized road tread treatment observations. He stated that: (1) most road tread delivery was at stream crossing approaches, and that this was generally unavoidable; (2) all roads were outsloped either by full re-contouring or ripping and draining; (3) field observations suggest there is no significant difference in the efficiency of the two methods of road surface treatment to prevent sediment delivery; (4) overall field observations suggest minimal erosion and sediment delivery is occurring from the decommissioned road surface between sites; and (5) these observations suggest that current CDFG protocols for road surface treatments are effective.

Following the formal presentation, there was a lengthy discussion of the study results. Tom stressed that proper operator performance is the key for this work—and that it is a real wildcard. Big crossings with large drainage areas tend to have more adjustments, since there are large volumes of water available to erode fill slopes. Tom stated that we can do a better job by: (1) avoiding poor spoil management [spoil material should be placed in a stable location where it cannot enter the stream network], and (2) properly treating springs, which have the potential to cause large gullies. It was suggested that these items are common, but easily avoidable.

JDSF Road 600 Decommissioning Case Study

Following lunch, Elizabeth Keppeler, USFS-PSW, presented a PowerPoint on the Road 600 decommissioning project located in the South Fork Caspar Creek watershed on Jackson Demonstration State Forest. Liz gave a brief history of management activities in the South Fork. The main South Fork road was built in 1967, with three-fourths of its length within 200 feet of the stream channel. Associated spur roads were built from 1971-1973, prior to the implementation of the modern Forest Practice Rules, when the South Fork was selectively tractor logged. A considerable number of Road 600 landslides were noted in the 1990's during water years with high precipitation totals.

In 1998, 2.8 miles of Road 600 were decommissioned without first completing rigorous road inventory work. End hauling of spoil material from 26 stream crossing excavations was not specified in the contract developed for the project. Eight cross-drain relief culverts were also removed, while an additional eight minor crossings remained untreated. The contract specified that the crossings were to be excavated to the original channel depth, side slopes were to be laid back at less than 50%, and jute netting was to be applied at excavated crossing sites. The upper half of the road (1.2 miles) was outsloped, while the remainder (as well as the upper 1.2 miles) had cross drains installed every 100 feet. The total cost of the work was \$32,495.

Erosion was documented from gully measurements following one and three over-wintering periods. Additional measurements consisted of a longitudinal profile with three to five cross-sections at nine benchmarked sites and a detailed topographic survey at a tenth crossing where the road crossed the main stem of the South Fork. Surveying work was completed at these sites after one and four over-wintering periods. Additionally, photo points were established and a contract compliance survey was completed in November 2002.

After the first winter, gully erosion measured at 32 sites totaled 851 yd³, with approximately half of this erosion occurring at just four sites. The mean erosion at the restored stream crossings averaged 32 yd³, and gullies > 65 yd³ were created at 3 sites. During the first winter after treatment, the flood of record, with an estimated recurrence interval of 44 years, occurred in the South Fork on March 24, 1999. After this event, channel incision of up to 6.5 feet occurred at some sites. Following three over-wintering periods, the eroded volume from all the inventoried features increased 17% to 993 yd³ (~4% of fill removed). The mean erosion for the 26 decommissioned stream crossings increased 11% to 36 yd³. Similar to results seen after one winter, only 3 crossing sites produced more than 65 yd³ of erosion. Erosion was negligible along the outsloped road surface and at most cross-drain locations and relief culverts. Three crossings continue to erode after eight winters.

Since streamflow and sediment yield are accurately measured in the South Fork Caspar Creek watershed, this basin provides a unique opportunity to put the erosion measurements from the road decommissioning work into the context of overall watershed sediment yield (for detailed information on the Caspar Creek watershed study, see: <http://www.fs.fed.us/psw/topics/water/caspar/>). Gullied stream crossings along the decommissioned road were found to account for nearly one-third of the total inventoried erosion volume and 57% of the sediment load in the South Fork Caspar Experimental Watershed during the first post-treatment winter.

Liz offered the following recommendations based on the Road 600 project: (1) improved determination of appropriate channel excavation depths is required (use DFG 2006-Chapter 10, California Salmonid Stream Habitat Restoration Manual); (2) improved inspection during field work is needed to ensure these excavation depths are reached; (3) newly excavated crossings with significant drainage areas should be armored with appropriately sized boulder rip-rap or grade control structures (e.g., rock and log weirs), and (4) streambanks must not be left too steep (i.e., banks sloped back from the channel and stabilized to prevent slumping). **A California Forestry Note (No. 120) has been written for this project and will be available shortly on the following website:** <http://www.demoforests.net/notes.html>.

Gienger “Monitoring and Tracking by Plan Proponents” Proposed Rule Language

Richard Gienger introduced this agenda item by summarizing work that has taken place since May 2006 on his monitoring and tracking by plan proponents proposal. In response to concerns raised at past meetings regarding duplicative monitoring work that would occur with this requirement, a short one page document was produced last year proposing that an MSG subcommittee be formed to: (1) review and improve the draft list of monitoring activities that are occurring on private timberlands, (2) evaluate the effectiveness of each approach in providing information on impacts to the beneficial uses of water associated with timber harvesting operations—especially impacts to listed anadromous fish species, and (3) evaluate the costs and benefits of the various monitoring approaches to aid the BOF, timberland owners, regulatory agencies, and the public in selecting adequate, cost effective monitoring approaches that will help ensure the protection and recovery of listed species.

At the February MSG meeting, acting MSG chair George Gentry stated that he would have the BOF Forest Policy Committee review the one page document, prior to forming the MSG subcommittee to work on this issue. While George was not able to attend the current meeting, he instructed Pete Cafferata to inform the group that the BOF approved the concept of forming the subcommittee at their April meeting in Riverside. Board member Jim Ostrowski informed Pete that the committee is specifically chartered to work on the three items listed above. He also told Pete that the Board anticipates that the MSG will form the subcommittee itself without formal BOF appointments. **Due to limited attendance at this MSG meeting, the only volunteers to work on the subcommittee were Richard Gienger and Pete Cafferata. Danny Merkely stated that he would speak to Regional Water Quality Control Board staff regarding this subcommittee. If other MSG participants have an interest in being a member of this subcommittee, please email Pete at: pete.cafferata@fire.ca.gov.**

Phase II of the Modified Completion Report Monitoring (now called FORPRIEM)

Clay Brandow, CAL FIRE, provided the group with draft protocols for the second phase of the Modified Completion Report monitoring program, now to be identified as FORPRIEM (Forest Practice Rules Implementation and Effectiveness Monitoring). The final report from the first phase of the project is available on the MSG website at: http://www.bof.fire.ca.gov/pdfs/MCRFinal_Report_2006_07_7B.pdf.

Phase II of the program will be very similar to the first phase, with slight modifications to correct identified deficiencies, starting with the more descriptive name for the project. Clay stated that this phase of the study will use a random 10% sample of THPs, based on year

of submission, that have been completed and are undergoing Work Completion Reports. The random lists begin in 2002 to ensure that plans have been accepted after the passage of the Threatened or Impaired Watersheds Rule Package. Lists run through 2011, and field work will continue to be done by CAL FIRE Forest Practice Inspectors. WLPZ sampling will be similar to that used from 2001 through 2004, but the field protocols have improved instructions on how to locate random, 200 foot long WLPZ transects. Road sampling, while similar in approach, will utilize a simpler form, and the required road segment length is reduced from 1000 feet to 660 feet (10 chains). There is a new general information sheet to fill out that includes EHR, type of surfacing, position of road segment, photos taken (yes/no), and recommend follow-up monitoring (yes/no). Road slope and side slope have been added to the revised road transect form. The watercourse crossing protocols continue to require sampling two crossings closest to the road segment. There is a general information page that requires information used in the first phase, as well as new items, such as whether a photo point was established. Implementation ratings are circled on the implementation form for data entry clarity and the effectiveness form has slight modifications.

Clay will present the full FORPRIEM package to the CAL FIRE Forest Management Committee (FMC) in May. If MSG participants want an electronic copy of the protocol package, please email Clay at: clay.brandow@fire.ca.gov. If reviewers have comments, please provide them to Clay by May 2nd. Training sessions for Forest Practice Inspectors, Review Team agency personnel, RPFs, and the public (as space allows) will be scheduled soon.

Brief IMMP and TAC Updates

Pete Cafferata informed the group that the MSG Interagency Mitigation Monitoring Program (IMMP) Subcommittee will be meeting on May 8th in Willows to review revised pilot project protocols developed by the Coast and Inland IMMP pilot project teams. Field testing of the revised protocols will occur this spring, summer and fall (i.e., Phase II of the IMMP pilot). The BOF's Technical Advisory Committee (TAC), formed to oversee a scientific literature review of studies pertinent to riparian buffers and functions, met on April 2nd in Sacramento and April 18th in Redding to finish work on primers, key questions, and suggested references for five riparian function areas. **A final contract Scope of Work (SOW) will be provided to the BOF prior to their May meeting in Sacramento.**

New and Unfinished Business

Richard Gienger asked if it would be possible to have Angela Wilson, CVRWQCB, provide the MSG with a brief summary of the monitoring data that has been received to date for their conditional waiver monitoring program. **Pete Cafferata agreed to speak with Ms. Wilson and determine whether it would be possible for her to provide the MSG with a presentation on waiver monitoring results.**

Next MSG Meeting

The next MSG meeting date is tentatively set for July 24th in the Redding area. When an exact location is available, it will be emailed to the group along with the meeting agenda.